Preface

The last five years or so have seen, on the one hand, an enormous amount of published research about computational neural networks and their applications in pattern recognition and control. On the other hand, we have witnessed the growth of a (roughly) billion dollar per year industry in Japanese commercial products (such as air conditioners, washing machines, and train controllers) based on various ideas in fuzzy logic. These two technologies seem to be very compatible in that they each provide a means for solving specialized problems that the other cannot do as well; and together they ostensibly offer a useful approach to the design of a large part of the engineering and scientific systems that we hope will mimic "intelligent" behavior.

This issue contains eight papers that were an outgrowth of work presented by the authors at the Second NASA joint workshop on Fuzzy Logic and Neural Networks, held at the NASA Johnson Space Center in Houston, April 1990. The workshop had about 250 participants, and many of the papers were about fuzzy logic, or neural networks, but not both. However, it was clear from the papers that did discuss the integration of these two ideas, and from the attendees at the workshop, that there was a growing excitement about the potential synergism between the two disciplines. This marriage has recently become very much more in evidence due to the sponsorship by the IEEE Neural Networks Council of the first IEEE International Conference on Fuzzy Systems, which will be held in San Diego on March 8–12, 1992. Indeed, tentative IEEE plans call for an International Congress on Intelligent Systems to be held in Washington, D.C. in 1994 that will combine the IEEE International Conferences on Neural Networks and Fuzzy Systems.

All of this activity signifies (at the least) a great interest in the topics addressed by the papers in this special issue. Whether this interest and activity are harbingers of developments that will translate into fielded applications that jointly utilize fuzzy logic and neural networks remains to be seen. Perhaps some of the ideas recorded in the articles published in this volume will contribute to the evolution of this technology.

I have enjoyed working on the compilation of this special issue, and in this regard I would like to publicly recognize the assistance and support of Bob Lea and James Villereal at NASA Johnson Space Center and Paul Werbos at the National Science Foundation. Aside from their own research interests, Bob, James, and Paul have all been active supporters of both the fuzzy logic and neural network communities for many years. Their patience, persistence, and foresight are, in large measure, responsible for this special issue.

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